



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,487	10/29/2001	Robert Burgess	10015534	7488

7590

07/21/2003

HEWLETT-PACKARD COMPANY
Intellectual Property Administration
P.O. Box 272400
Fort Collins, CO 80527-2400

EXAMINER

RUGGLES, JOHN S

ART UNIT	PAPER NUMBER
----------	--------------

1756

DATE MAILED: 07/21/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/055,487

Applicant(s)

BURGESS, ROBERT

Examiner

John Ruggles

Art Unit

1756

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 July 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) 8-21 and 24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 22-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, claims 1-7 and 22-23 of Paper No. 3 in response to the restriction requirement of Paper No. 2 is acknowledged. Accordingly, claims 8-21 and 24 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to non-elected inventions.

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "604" and "610" in Figure 6 have both been used to designate the outer box containing fabrication printer 2 components. Also in Figure 6, this same reference character "604" has been used to designate both the outer box containing fabrication printer 2 components and, within this printer, the platform in the bath 608. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities: (1) --photoresist-- is misspelled at line 10 on page 4 and (2) in order to match Figure 6, "platform 608" in the description of this figure found at line 10 on page 12 must be corrected to --platform 604--.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Batchelder, et al. (US Patent 5,303,141).

Batchelder describes a process and apparatus for fabricating a three-dimensional solid object by extrusion of light or heat curable building material through a scanning extrusion nozzle orifice to build up successive layers as shown in Figures 1A and 2A and described at column 4, lines 37-65 and column 5, line 59 to column 6, line 6. Curing of the building material is initiated as it is extruded from the nozzle orifice by coupling a laser or radiant lamp having an associated focusing reflector to the nozzle (column 7, lines 12-22). For example, the deposited building

Art Unit: 1756

material is imaged for curing by scanning with a plurality of laser diodes to generate a sheet of light having a thickness corresponding to that of the deposited bead of building material and a width corresponding to the width of the imaging objective (understood to be light focusing lenses coupled to the scanning nozzle along with associated laser diode light-emitting centers, column 9, lines 57-66).

Claims 1-2, 5, and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Arai, et al. (US Patent 6,180,050).

Arai teaches a process and apparatus for fabricating a solid article using photo-activatable resin building material laid down in successive layers with each layer patterned by scanning exposure to selectively polymerize and cure the building material using a multiplicity of blue light emitting diodes (LEDs) integrated with connected optical fibers and graded refractive index (GRIN) lenses for focusing the light from each LED (column 5, lines 16-48). As shown in Figure 1 and described at column 4, lines 14-30, a platform tray 19 supporting the layered solid article is lowered by an elevator 15 a predetermined distance inside a bath of photocurable resin solution 13 for laying down and patterning each successive layer of cured building material. The liquid level of the bath and the tray height are gradually adjusted as each successive layer of building material is added and cured.

Claim 5 is rejected under 35 U.S.C. 102(b) as being anticipated by either Lawton (US Patent 5,980,812) or Kerekes, et al. (US Patent 6,126,884).

Art Unit: 1756

Lawton shows a process for fabricating a three-dimensional solid object by building up layers formed by ink jet or powder jet technology and subsequent laser diode imaging to cure the building material (column 10, lines 41-42 and column 16, line 32). Ink jet technology encompasses ink jet printing using a printing cartridge that includes an orifice plate for selectively spraying the building material.

Kerekes discloses a process and apparatus for rapid prototyping and fabricating of three-dimensional solid objects by stereolithography (abstract). Multiple ink jet orifices are used to supply building material in order to speed the building process (column 2, lines 19-20). Ink jet orifices are understood to selectively spray the building material. The supplied building material is imaged using laser diodes associated with focusing optics including scanning mirrors, fiber optic cables, and movable lenses as shown in Figures 1c-d and described at column 8, line 13 to column 10, line 58.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder in view of either Lawton or Kerekes.

While describing fabrication of a solid article by photocuring successive layers of building material using a moving nozzle orifice with coupled laser diodes and focusing lenses, Batchelder does not specify using a printing cartridge that includes an orifice plate.

The teachings of Lawton and Kerekes are discussed above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a printing cartridge having an orifice plate such as found in ink jet printers used to apply or spray building material as shown by Lawton or disclosed by Kerekes; the printing cartridge being modified to include laser diodes and associated focusing lenses at nozzle locations set at predetermined distances from the laser diodes to focus light on the applied building material for curing, as suggested by Batchelder. This is because these references relate to the same art of building up solid layers by successive application from moving nozzle orifices and selective curing by laser diodes.

Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Batchelder in view of Gelbart (US Patent 6,214,276).

While describing fabrication of a solid article by photocuring successive layers of building material using a moving nozzle orifice with coupled laser diodes and focusing lenses, Batchelder does not specify additional steps of curing the article (apart from initial curing to solidify each layer) and rinsing non-polymerized building material from the article.

Gelbart teaches a method of fabricating three-dimensional objects using plural laser diodes for selective curing by polymerization of a liquid precursor building material, layer-by-layer. The initial curing of successive layers to solidify the building material is sometimes

Art Unit: 1756

followed by baking or UV exposure for further curing and washing to remove uncured, non-polymerized building material (column 4, line 53 to column 5, line 35).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to follow the layered building process as taught by Batchelder with additional post-building steps of further curing to harden the solid portions and washing or rinsing to remove non-polymerized building material from the article, as taught by Gelbart.

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arai in view of Gelbart.

While incorporating curing using a blue LED of the patterned building material by polymerization of each successive layer, Arai does not specify separately curing and rinsing of the patterned solid article.

The teachings of Gelbart are discussed above.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to follow the layered building process using a blue LED for photocuring as taught by Arai with additional post-building steps of further curing to harden the solid portions and washing or rinsing to remove non-polymerized building material from the article, as taught by Gelbart.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Ruggles whose telephone number is 703-305-7035. The examiner can normally be reached on Monday-Thursday and alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

John Ruggles
Examiner
Art Unit 1756

A handwritten signature in black ink, appearing to read "Mark F. Huff", with a long horizontal line extending to the right.

MARK F. HUFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700